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Planning and the responsibility for planning lies with the administrative official responsible for construction, operation and maintenance of the plant. Qualities which planning directors should possess are enumerated. Specific suggestions for more efficient planning and construction of higher education facilities are given as follows--(1) the maintenance of a strong central planning office, adequately manned with competent personnel which should be the center of all campus planning, (2) a good deal of attention should be given to the selection of structural, mechanical, and electrical engineers, (3) architects should be given a written program of requirements with supplementary instructions, a topographic map, and a report on any investigation of site foundation conditions, (4) the central planning office should have the authority to approve or disapprove subcontractors, (5) all supervisory personnel in the department of physical plant should review drawings and specifications, (6) the campus planning committee should be advisory only, (7) a program of regular building inspection must be maintained, and (8) an effort should be made to promote and maintain communications between departments. (NI)

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PLANNING AND CONSTRUCTION OF COLLEGE AND UNIVERSITY BUILDINGS

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The planning, construction, maintenance and operation of college and university physical facilities has become big business, with no end of growth in sight. This rather obvious conclusion can be drawn from a report published a year ago by Sam Brewster, Director, Physical Plant, Brigham Young University. In this report the total number of square feet estimated to be completed or started by 1970 from the 203 schools reporting was a staggering 172,618,000 square feet of space or a total estimated expenditure of $13,452,375,500. This outgo of dollars would operate the office of Education and National Science Foundation for the next three years. Surely institutions planning to spend this kind of money in the next few years must provide an organization to assure that projects are well conceived, well planned, well constructed, and maintained.

Many panel discussions, conferences and papers on college and university planning have resulted in as many different organizational structures for campus planning. Each institution must develop a procedure which is tailor-made to their specific needs.

At Ball State, the department of campus planning and development is associated with the Vice President of Public Affairs and College Development. Campus Planning Committees are appointed by the President and are composed of the Vice President of Public Affairs representing the President, the Superintendent of the Physical Plant representing the business office, divisional deans of the departments involved in planning and heads of the departments requesting new facilities or remodeling.

A new committee is appointed with each project to be planned. The Vice President of Public Affairs and the Physical Plant Superintendent serve on all committees. This organizational structure will function satisfactorily as long as strong communications are maintained between the departments, business office and office of Public Affairs. When communications break down, this kind of organization fails to function. Many other organizational hybrids exist in the colleges and universities throughout the country.

In the survey by Sam Brewster, a study of the tables indicates that physical plant departments are playing an increasingly larger role in this important phase of school development. It is also apparent that in many cases they could and should plan a larger part. Planning, or the responsibility of planning logically lies with the administrative official responsible for construction, operation and maintenance of the physical plant. The four functions are inseparable. I feel so strongly about this that I cannot understand how any clear thinking administrator can rationalize their separation. I am sure there are many good reasons why organizational structure differs from school to school but only one stands out, the difference

in people or personnel. As institutions obtain enrollments of 20,000, 25,000 or 30,000 it may be better to have a planning department separate from the physical plant maintenance and operation, but should certainly maintain a close working relationship between the two areas.

I am certain the hybrid planning committees at many colleges and universities have become so because physical plant personnel have not been qualified to coordinate the elements involved in the planning process.

A well qualified planning committee chairman or director should possess the following qualities:

1. Experience in construction and planning.

2. Ability to get along well with others.

3. Thorough appreciation of the role of the architect.

4. Thorough understanding of latest construction procedures, latest materials of construction and the process of preparation of the bid documents.

5. Ability to edit and publish guidelines or instruction to the architect and engineers, or better yet, the ability to convey the wishes and needs of the college or university to architects and engineers.

6. A thorough understanding of the complexity of modern college building with the addition of air conditioning, closed circuit television, electronic hearing and speech laboratories, foreign language laboratories, music listening laboratories, automatic fire detection devices, central graphic panels, data processing equipment, and electronic lighting and sound reinforcement of modern auditorium construction.

7. A keen interest in the total campus planning, construction, maintenance and operation without a personal "axe to grind."

Of these the most important is the preparation of a written program on each project. This program should be prepared before the architect is selected. Here attention should not be given so much to the shape or form that the building will take, but more to the size, use, special requirements, and special features desired in its various components that, taken together, will form the building. A department should be required to write a complete outline of their most feasable needs even though we know that the money available is not sufficient to build space for the entire program. In this way they are compelled to think through their entire program requirements. We can reduce their complete program to square footage and arrive at an estimated cost for their entire program. The amount of appropriation is then considered against the total cost which determines the portion of the entire program which can be built with present appropriation. The department must then determine in consultation with the planning committee which part of the program they want to build now. Control

must be exercised here to prevent the department from building only offices and research laboratories instead of class rooms and undergraduate laboratories.

General faculty committees should be discouraged in drawing over-all plans -- this is the architect's job. Schematic drawings of individual rooms or relations of equipment within the rooms are excellent, together with a descriptive presentation of function and relationship of functions. All too often departmental committees become embroiled in the physical structure and overlook important details which only they can furnish.

Well qualified planning committee chairmen or directors are scarce. An administrative faculty member is usually appointed by the President to do this job, because of his interest in college development, or because he works well with the President, or perhaps because a qualified physical plant director isn't available. More often than not, he isn't qualified to effectively develop program requirements of the department in need of space. A well written program needs the guiding hand of an experienced planning committee director. It is too much to expect of a department head or divisional dean to produce a written program that will effectively transmit information to the architect. When we find ourselves in this dilemma, we generally resort to selecting an architect to do all the spade work for us. After having talked to a representative group of faculty, he begins to "get the picture." He then prepares the one line preliminary sketches necessary to communicate the ideas supplied by the project committee. The conscientious architect will spend many, many hours trying to procure sufficient information from his committee to best meet the owner's needs. This is an acceptable method of working with an architect. You can be certain our architect is conscientious.

A well-written program presented to the architect as he is employed defines the "problems" and eliminates the risk of a building design that doesn't meet the needs of the department. Much could be said about the selection of an architect, his qualifications, his mechanical, electrical, and structural team and his experience. There are thousands of architectural firms in the country. The great majority of them possess the skill, artistic judgment and technical know-how to design university structures. The problem is to design structures that will serve adequately the complex uses which would be made of the many components of the building. We at Ball State have been permitted to work with two architectural firms for the bulk of our planning and construction program. We have enjoyed an excellent working relationship with these two firms and have a strong voice in determining the final building design. When a state architect is required or a different firm is employed for every project, the task of communication with the architect becomes more and more difficult and quite often impossible.

Effective communication between the department requires space, the planning committee, the President, the business office, the physical plant and the architect. This is quite difficult when the owner is not permitted to select the architect.

Many colleges and universities are appointing permanent campus planning committees in the planning process which are advisory only and make all of their recommendations to the President. Those committees are composed of a direct representative of the President, usually one of the Vice

Presidents, a representative of the business office, usually the director or Superintendent of the physical plant. The deans or a representative dean of the various colleges, the Vice President or director of Auxilary Services, a representative from the faculty and the director of Space Studies if such an office exists. This committee meets to perform the following functions:

1. Interview and recommend architects, engineers, interior decorators and consultants for all projects requiring professional services.

2. Reviews all plans submitted by architects and engineers and when satisfied recommends to the President that they be accepted.

3. Discusses building problems with deans, directors and departmental heads.

4. Familiarizes themselves with the total space requirements at the college or university.

5. Reviews and makes suggestions on master plan revisions and changes.

6. Looks over other plans of major and minor remodeling or alteration by the department or physical plant.

The committee does not exercise administrative control over any phase of the many activities of the university nor does it concern itself with the details of everyday plant operation and maintenance and with minor physical plant changes which result.

The second part of this planning process is or should be the individual project planning committee. This committee should not be confused with the campus planning committee. A building committee of five to seven persons is appointed for each building that is to be planned, but the campus planning committee works with them all. These building project committees are composed of the department for whom the building is to be constructed. This divisional or college dean to which the department or departments are responsible, the direct representative of the President and the director or superintendent of the physical plant. The project committee formulates the written program together with the planning committee and works very closely with the architect through the adoption of preliminary drawings. The project committee could better be described as a technical committee charged with the responsibility of communicating specific needs to the architect and thence into plans acceptable to the planning committee, the President and the college and university board.

After the planning stages, the project committee has less frequent contact with the architect but is subject to call. During construction of the building, the project committee works with the college or university purchasing department in selecting furniture and equipment. As soon as the building is accepted and occupied, the project committee for that particular building is dissolved.

The third phase of the planning process is a campus construction planning office. These offices are becoming a vital part of educational institutions. A campus center which architects, engineers, faculty and administrators can use as a clearing house to gather material samples, prepare sketches and plans for minor changes and alterations, prepare specifications for the purchasing department on major items of equipment, provide information on all campus topography, prepare instructions to architects and engineers, provide utility plans and service information, keep the campus record drawings and specifications, keep the public and business affairs office supplied with construction planning documents and contain the construction inspection team responsible for supervision while under construction.

The most important responsibility of this office should be the review of all preliminary and working drawings and specifications before they are approved by the university. The operating and maintenance personnel should prepare detailed lists of omissions, mistakes and questions before they are let out for bid. This can be done after plans and specifications are completed and ready for the bidders and can be incorporated into addenda. Many architects resort to the use of too many "typical" details which lead to points of argument and disagreement after construction has started. These are difficult to interpret specifications and details need to be corrected or clarified before bids are let and not during construction.

The planning process is becoming more and more complicated because the specific needs are more complex. Much could be included here on inspection and supervision of construction. The inspection of the job during construction is both architect and owner responsibility. A good working relationship between the job inspectors and the general supervision is absolutely necessary. Misunderstandings can cost many hours of time as well as dollars. Mutual trusts between general contractor and owner can save many construction dollars. This relationship between owner and architect inspection over the general superintendent can affect the bid if inspection is too tight on a project. Regular weekly coordination meetings between owner, architect and contractor are essential to keep a project running smoothly. Many a knotty problem has been solved at these weekly meetings.

Many other phases of the construction process could be discussed at length in this report such as site, selection, the contract and bid documents, methods of bidding, individual or united contracts, bid peddling, material questionnaire, the "or equal" clause, liquidated damages, utilities, basic design concept, selection of the architect, the sq. ft. method of comparison and operation costs and statistics. Each of these factors does effect the end product of the building finally accepted and occupied. Time doesn't permit their discussion at this time.

To summarize, I would like to recommend a few points for serious consideration in the planning process of universities and colleges:

1. That a college or university should maintain a strong central planning office, possibly in the Department of Physical Plant. If it is not located in Physical Plant, the strongest possible liaison should be maintained between the planning office and Physical Plant. In any case the planning office should be adequately manned with competent personnel, and should be the center of all campus planning.

2. That just as much care should be given to the selection of the structural, mechanical, and electrical engineers as to the architects. Mechanical and electrical work is comprising from thirty to forty per cent of the cost of modern university buildings. At Ball State we consult with our architects on these important associates, and reserve the right to disapprove anyone not acceptable to us.

3. That each architect should be given the following carefully prepared items after signing a contract, and before he does any extensive planning:

   (a) A written program of requirements.
   (b) Instructions to supplement the written program These instructions should present information to the architect on the details that the school has standardized and that are common to nearly all projects.
   (c) A carefully prepared, comprehensive topographic map.
   (d) A preliminary investigation of, and report on, foundation conditions at the project site. (This may not be needed at many schools).

4. That whenever possible the owner should reserve the right to approve or disapprove any subcontractors proposed by general contractor. And the materials proposed when different than specified.

5. That every supervisor and foreman in the Department of Physical Plant should be required to review both preliminary drawings and working drawings and specifications; and to give his comments and recommendations in writing to one person for compiling and editing, and for transmittal to the architect.

6. That the Campus Planning Committee should be advisory only, limit its activities to major projects, and not become involved in routine operational and maintenance matters.

7. That the school should maintain adequate, competent building inspection. These building inspectors should be on the job whenever the contractor or his subcontractors are working.

8. That every effort be made to maintain strong communications between Administrative Personnel, Business Office, Faculty, Physical Plant and Campus Planning Committee.